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II. *An Essay upon the Natural History of Whales, with a particular Account of the Ambergris found in the Sperma Ceti Whale. In a Letter to the Publisher, from the Honourable Paul Dudley, Esq; F. R. S.*

S I R,

I AM very sensible that the World has long since, and often been entertained with various Relations of this wonderful Creature: But as I shall endeavour to avoid any vain Repetition, so I flatter myself with the Hopes of presenting the Royal Society with some Particulars not yet published, both of the Whale in general, and more especially of that Species or Kind of Whale, which our People call the *Sperma Ceti*, but, in my Opinion, much rather deserves the Name of the Ambergris Whale. But here I would have it noted, that the following Account respects only such Whales, as are found on the Coast of *New England*.

And of these there are divers Sorts or Kinds.

* As first, The Right, or Whalebone Whale is a large Fish, measuring sixty or seventy Feet in Length, and very bulky, having no Scales, but a soft fine smooth Skin, no Fins, but only one on each Side, from five to eight Feet long, which they are not observed to use, but only in turning themselves, unless while young, and carried by the Dam on the Flukes of their Tails; when with those Fins they clasp about her Small, and so hold them-

* *The several Species of Whales.*

ſelves on. This Fiſh, when firſt brought forth, is about twenty Feet long, and of little Worth, but then the Dam is very fat. At a Year old, when they are called Short-heads, they are very fat, and yield to fifty Barrels of Oil, but by that Time the Dam is very poor, and term'd a Dry-skin, and won't yield more than thirty Barrels of Oil, tho' of large Bulk. At two Years old, they are called Stunts, being ſtunted after weaning, and will then yield generally from twenty four to twenty eight Barrels. After this, they are term'd Scull-fiſh, their Age not being known, but only gueſs'd at by the Length of the Bone in their Mouths. The Whale-bone, ſo called, grows in the upper Jaw on each Side, and is ſometimes ſix or ſeven Feet in Length. A good large Whale has yielded a thouſand Weight of Bone. 'Tis thought by ſome, that the hairy Part of the Whale-bone, and which is next to the Tongue, ſerves in the Nature of a Strainer of their Food.

The Eye of a Whale is about the Bigneſs of an Ox's Eye, and they are ſituated in the After-part of the Head on each Side, and where the Whale is broadest; for his Head tapers away forward from his Eyes, and his Body tapers away backward; his Eyes are more than half way his Depth, or neareſt his Under-part; juſt under his Eyes are his two Fins before-mentioned; he carries his Tail horizontally, and with that he ſculls himſelf along.

The Entrails of this Whale are made and ſituated much like thoſe of an Ox, and their Scalps are ſometimes found covered with Thouſands of Sea-lice. One of theſe Whales has yielded one hundred and thirty Barrels of Oil, and near twenty out of the Tongue. The Whale-bone Whale is the moſt valuable, except the *Sperma Ceti* Whale.

The Scrag Whale is near akin to the Fin-back, but, instead of a Fin upon his Back, the Ridge of the After-part of his Back is scragged with half a Dozen Knobs or Nuckles; he is nearest the right Whale in Figure and for Quantity of Oil; his Bone is white, but won't split.

The Finback Whale is distinguished from the right Whale, by having a great Fin on his Back from two Feet and an Half, to four Feet long, which gives him the Name; he has also two side Fins, as the Whale-bone Whale, but much longer, measuring six or seven Feet. This Fish is somewhat longer than the other, but not so bulky, much swifter, and very furious when struck, and very difficultly held; their Oil is not near so much, as that of the right Whale, and the Bone of little Profit, being short and knobby. The Belly of this Whale is white.

The Bunch or humpback Whale, is distinguished from the right Whale, by having a Bunch standing in the Place where the Fin does in the Finback. This Bunch is as big as a Man's Head, and a Foot high, shaped like a Plug pointing backwards. The Bone of this Whale is not worth much, tho' somewhat better than the Finback's. His Fins are sometimes eighteen Feet long, and very white; his Oil much as that of the Finback. Both the Finbacks and Humpbacks are shaped in Reeves longitudinal from Head to Tail on their Bellies and their Sides, as far as their Fins, which are about half way up their Sides.

* The *Sperma Ceti* Whale. This Fish is much of the same Dimension with the other, but of a greyish Colour, whereas the others are black; he has a Bunch on his Back like the Humpback, but then he is distin-

guished by not having any Whale-bone in the Mouth ; but instead of that, there are Rows of fine ivory Teeth in each Jaw, about five or six Inches long. One of these Teeth I have done myself the Honour to send the Society. The Man, who gave it me, says, the Whale was forty nine Foot long, and his Head made twelve Barrels of *Sperma Ceti* Oil. They are a more gentle Fish than the other Whales, and seldom fight with their Tails ; but when struck, usually turn upon their Backs, and fight with their Mouths. The Oil, which is made of the Body of this Fish, is much clearer and sweeter than that of the other Whales.

* The *Sperma Ceti* Oil, so called, lies in a great Trunk about four or five Feet deep, and ten or twelve Feet long, near the whole Depth, Breadth, and Length of the Head, in the Place of the Brains, and seems to be the same, and disposed in several membranous Cells, and covered not with a Bone, but a thick grissly Substance below the Skin, through which they dig a Hole, and lade out the clear Oil. Not but that the Head, and other Glandulous Parts of this Fish, will make the *Sperma Ceti* Oil ; but the best, and that which is prepared by Nature, is in the Trunk aforesaid : And an ingenious Man, who has himself kill'd many of these Whales, assures me, that only the Trunk will afford from ten to twenty Barrels. Besides the *Sperma Ceti* Oil, this Fish will yield from twenty to fifty Barrels of common Oil.

One of our Country Doctors tells me, that the Tooth of this Fish, shaved or powdered, and so infused in Liquor, equals the Harts-horn, and has been used in the Small-Pox, and given to Lying-in-Women, in Case of Sickness, with Success. The Quantity is as much as

will lie upon an *English* Shilling. I meddle not here with the precious Ambergris found in this Whale, because I design to close the Whole with that Discovery.

I go on therefore, in the second Place, to give an Account of the Manner of the Propagation of Whales. They generate much like to our neat Cattle, and therefore they are termed Bull, Cow, and Calf. The *Latins* called the Whale *Bellua Marina*. They bring forth but one at a Time, and but every other Year. When the Cow takes Bull, she throws herself upon her Back, sinking her Tail, and so the Bull slides up, and, when the Bull is slid up, she clasps him with her Fins. A Whale's Pissel is six Feet long, and at the Root is seven or eight Inches Diameter, and tapers away till it comes to about an Inch Diameter: his Stones would fill half a Barrel, but his Genitals are not open or visible, like those of the true Bull. The Calf, or young Whale, has been found perfectly form'd in the Cow, when not above seventeen Inches long, and white; yet, when brought forth, is usually twenty Feet, but of a black Colour; it is supposed they go with their Young about nine or ten Months, and are very fat in that Time, especially when they bring forth. When the Female suckles her Young, she turns herself almost upon her Back, upon the Rim of the Water, she has two Teats of six or eight Inches long, and ten or twelve Inches round. The Milk is white, like that of a Cow; and upon opening a young sucking Whale, the Milk was found curdled in his Bag, just like that of a Calf.

* 3. The Care of their Young is very remarkable, they not only carrying them on their Tails, and suckling them, but often rising with them for the Benefit of the Air;

and however they are chased or wounded, yet as long as they have Sense, and perceive Life in their Young, they will never leave them, nor will they then strike with their Tail, and if, in their running, the young one loses his Hold and drops off, the Dam comes about, and passing underneath, takes it on again. And therefore Care is taken by those who kill these Mate Fish (as they are called) only to fasten the Calf, but not to kill her, till they have first secured the Cow. For so soon as ever the Calf is dead, the Cow perceives it, and grows so violent, that there is no managing her.

4. The Whales are very gregarious, being sometimes found a Hundred in a Scull, and are great Travellers. In the Fall of the Year, the right or Whale-bone Whales go Westward, and in the Spring they are headed Eastward. But here it must be noted, that the several Kinds of Whales don't mix with one another, but keep by themselves.

5. Respiration. Their Way of Breathing is by two Spout-Holes in the Top of the Head. The *Sperma Ceti* has but one, and that on the left Side of the Head. Once in a Quarter of an Hour, when not disturbed, they are observed to rise and blow, spouting out Water and Wind, and to draw in fresh Air: but, when pursued, they will sometimes keep under Water half an Hour or more; tho' 'tis observed when any Cow has her Calf on her Tail, she rises much oftener (through a natural Instinct) for the young one to breath, without breathing herself. Out of their breathing Holes they spout great Quantities of Blood, when they have receiv'd their Death Wound.

6. Food or Sustainment. For the first Year, as has been already observ'd, they all suck the Dam. After they are weaned, the right Whales, as is generally supposed, live upon some ouzy Matter, which they suck up from the
Bottom

Bottom of the Sea. The Triers, that open them when dead, acquaint me, that they never observed any Grass, Fish, or any other Sort of Food in the right or Whale-bone Whale, but only a greyish soft Clay, which the People call *Bole Armoniac*; and yet an experienced Whale-man tells me, that he has seen this Whale in still Weather, skimming on the Surface of the Water, to take in a Sort of reddish Spawn or Brett, as some call it, that at some Times will lie upon the Top of the Water, for a Mile together. Here also it may be observ'd, that tho' the Body of this Whale is so very bulky, and so exceeding fat; yet when cut open, they are seldom found to have much more Draught than that of an Ox, and they dung much as neat Cattle do. Their Swallow is not much bigger than an Ox's; but the Finback Whale has a larger Swallow: for he lives upon the smaller Fish, as Mackarel, Herring, &c. great Sculls of which they run thro', and, with a short Turn, cause an Eddy or Whirlpool, by the Force of which, the small Fish are brought into a Cluster; so that this Fish, with open Mouth, will take in some Hundreds of them at a Time. The *Sperma Ceti* Whale, besides other Fish, feeds much upon a small Fish that has a Bill; our Fishermen call them Squid Fish. The small Peices of these Squid Bills are plainly to be discerned in the Ambergris, and may be pick'd out of it; they appear glazy, and like little Pieces of broken Shells.

7. The Way and Manner of killing Whales.

Mr. *Harris* in his *Bibliotheca Navigantium*, &c. has given a very particular Account of the Method of taking Whales at *Greenland*, and though our Way in *New England* differs very much from that, yet I shall wave it, as not so strictly appertaining to Philosophy. Only I would take notice of the Boats our Whale-men use in going from the Shoar after the Whale: They are made of Cedar Clapboards, and so very light, that two Men

Men can conveniently carry them, and yet they are twenty Feet long, and carry six Men, *viz.* the Harpooner in the Fore-part of the Boat, four Oar-men, and the Steers-man. These Boats run very swift, and by reason of their Lightness can be brought on and off, and so kept out of Danger. The Whale is sometimes killed with a single Stroke, and yet at other Times she will hold the Whale-men in Play, near half a Day together, with their Lances, and sometimes they will get away after they have been lanced and spouted blood, with Irons in them, and Drugs fastened to them, which are thick Boards about fourteen Inches square. Our People formerly used to kill the Whale near the Shore; but now they go off to Sea in Sloops and Whale-boats, in the Months of *May*, *June*, and *July*, between *Cape-Cod* and *Bermudas*; where they lie by in the Night, and sail to and again in the Day, and seldom miss of them; they bring home the Blubber in their Sloops. The true Season, for taking the right or Whale-bone Whale, is from the Beginning of *June*, to the End of *May*; for the *Sperma Ceti* Whale, from the Beginning of *June*, to the End of *August*. And it has been observed by our Fishermen, that when a *Sperma Ceti* Whale is struck, he usually, if not always, throws the Excrements out of the *Anus*.

8. The wonderful, and even prodigious Strength of this Creature, which lies principally in their Tails, that being both their offensive and defensive Weapon. Many Instances of this Kind I have had from credible Persons, who were Eye-witnesses; I will mention but a few. A Boat has been cut down from Top to Bottom with the Tail of a Whale, as if cut with a Saw, the Clap-boards scarce splinter'd, tho' the Gunnel upon the Top is of tough Wood. Another has had the Stem, or Stern-post of about three Inches through, and of the

toughest Wood that can be found, into which the Ends of the Cedar Clap-boards are nailed, cut off smooth above the Cuddee, without so much as shattering the Boat, or drawing the Nails of the Clap-boards. An Oar has been cut off with a Stroke upwards, and yet not so much as lifted up out of the Thole-Pin. One Person had an Oar cut off, while in his Hand, and yet never felt any Jarring.

A few Years since, one of the Finback Whales came into an Harbour near *Cape-Cod*, and tow'd away a Sloop of near forty Tun, out of the Harbour into the Sea. This Accident happened thus: It is thought the Whale was rubbing herself upon the Fluke of the Anchor, or going near the Bottom, got the Fluke into her Nisket, or the Orifice of the *Uterus*, and, finding herself caught, tore away with such Violence, and tow'd the Sloop out of the Harbour, as fast as if she had been under Sail with a good Gale of Wind, to the Astonishment of the People on Shore, for there was nobody on board. When the Whale came into deep Water, she went under, and had like to have carried the Sloop with her, but the Cable gave Way, and so the Boats that were out after her, recover'd it. This Whale was found dead some Days after on that Shore, with the Anchor sticking in her Belly.

After a Whale is dead, it has been observed, that the same way the Head lies, so the Head will lie if not forcibly turned, and let the Wind blow which Way it will, that Way they will scull a Head, tho' right in the Eye of the Wind, and they are much easier tow'd to the Shore, if they die that Way with their Head, than any other.

9. The Enemies of the Whale, or the Fish that prey upon the Whales, and often kill the young ones, for they won't venture upon an old one, unless much wounded.

Our

Our Whale-men have given this Fish the Name of Killers. These Killers are from twenty to thirty Feet long, and have Teeth in both Jaws that lock one within another. He has a Fin, near the Middle of his Back, four or five Foot long. They go in Company by Dozens, and set upon a young Whale, and will bait him like so many Bull-dogs; some will lay hold of his Tail to keep him from threshing, while others lay hold of his Head, and bite and thresh him, till the poor Creature, being thus heated, lolls out his Tongue, and then some of the Killers catch hold of his Lips, and if possible of his Tongue; and after they have killed him, they chiefly feed upon the Tongue and Head, but when he begins to putrify, they leave him. This Killer is without doubt the *Orca*, that Dr. *Frangius* describes in his Treatise of Animals. His Words are these, *Quando Orca insequitur Balenam, ipsa Balena horribilem edit Mugitum, non aliter quam cum Taurus mordetur a Cane*. These Killers are of such invincible Strength, that when several Boats together have been towing a dead Whale, one of them has come and fastened his Teeth in her, and carried her away down to the Bottom in an Instant. And sometimes again, they have bit out a Piece of Blubber of about two Foot square, which is of that Toughness, that an Iron, with little Beards being struck into it, will hold it till it draws the Boat under Water. The Killers are sometimes taken, and make good Oil, but have no Whale-bone. The Carcases, or Bodies of dead Whales in the Sea, serve for Food for Gulls, and other Sea-Fowl, as well as Sharks, for they are not very nice.

* I come now to what I first and principally proposed, in this Essay on the Natural History of Whales, to give

* *Of Ambergris.*

an Account of the Ambergris. Many and various have been the Opinions even of the learned World, as to the Origin and Nature of this precious Perfume; some have reckoned it a *Bitumen*, and to issue from the Entrails of the Earth; others, that it was produced from some Insect, as Honey, Silk, &c. The famous Mr. Boyle, as I find it, in the Second Volume of *Lowthorp's Abridgment of the Philosophical Transactions*, communicates an Account of Ambergris, from a Dutch Merchant, who first denies it to be the Scum or Excrement of a Whale, and then gives it, as his Opinion, that it is a fat Gum that issues from the Root of a Tree, and that you may raise it in Quantities by planting those Trees by the Shore, and so the Stream will cast it up to great Advantage. But Truth is the Daughter of Time; it is now at Length found out, that this *Occultum Naturæ* is an Animal Production, and bred in the Body of the *Sperma Ceti* Whale, analogous to what is found in some Animals of the Land, as the Musk Hog or *Taiacu*, the Musk Deer, the Bezoar Sheep, and some Amphibious Animals, as the Musquash, &c. who have their valuable Scent in a particular *Cystis* or Bag. I am apt to think, that which first gave Occasion to the Notion of Ambergris being the Production of the Whale, was because it was found in considerable Quantities on the Shores of the Summer Islands, and among the *Bahama's*, where the dead Whales are frequently wreck'd and broke up with the Sea, and the Ambergris found floating, or on the Shore; but here again, the Ingenious, until very lately, were at a Loss, and divided in Opinion, for tho' they agreed it to come from the Whale, yet some took it to be the true and proper *Semen*, being found only in the Bull, at the Root of the *Penis*, near the Testicles; others again thought it was the Ordure or Excrement of the Whale.

The

The best and most exact Account of Ambergris, that I have been able to procure (and I may truly say, I have taken a great deal of Pains for it) I very lately received from one Mr. *Atkins*, now an Inhabitant at *Boston* in *New England*, who used the Whale Fishery, for ten or twelve Years together, and was one of the first that went out a fishing for the *Sperma Ceti* Whales, about the Year 1720, and then began to discover the Ambergris; and being a sober ingenious Man, what he says may safely be depended on; tho', for Substance, I have had it from several of the Whale-men.

His Relation, which was taken a few Days since from his own Mouth, is as follows:

“ The Ambergris is found only in the *Sperma Ceti*
 “ Whales, and consists of Balls or globular Bodies, of various Sizes, from about three Inches to twelve Inches
 “ Diameter, and will weigh from a Pound and an Half
 “ to twenty two Pounds, lying loose in a large oval
 “ Bag or Bladder of three or four Foot long, and two
 “ or three Foot deep and wide, almost in the Form of
 “ an Ox's Bladder, only the Ends more acute, or like
 “ a Blacksmith's long Bellows, with a Spout running
 “ tapering into and thro' the Length of the *Penis*, and
 “ a Duct, or Canal, opening into the other End of the
 “ Bag, and coming from towards the Kidneys; this Bag
 “ lies just over the Testicles, which are above a Foot
 “ long, and is placed lengthways at the Root of the
 “ *Penis*, about four or five Foot below the Navel, and
 “ three or four above the *Anus*. This Bag or Bladder
 “ is almost full of a deep Orange colour'd Liqueur, not
 “ quite so thick as Oil, and smelling strong, or rather
 “ stronger of the same Scent with the Balls of Amber-
 “ gris, which float and swim loose in it; the Inside of
 “ the Bag is very deeply tinged with the same Colour
 “ as the Liqueur, which may also be found in the Canal
 “ of

“ of the *Penis* ; the Balls seem to be pretty hard while
 “ the Whale is alive, inasmuch as there are many Times
 “ found, upon opening the Bag, large concave Shelves,
 “ of the same Substance and Consistence, that have scaled
 “ off from them, and the Balls themselves seem to be
 “ composed of several distinct Coats inclosing one ano-
 “ ther, something like the Coats of an Onion.

As to the Number of Balls, Mr. *Atkins* never found above four Balls in a Bag, and in the Bag where he found one that weighed twenty one Pounds, which was the largest he ever saw, there was no other in the Bag but that.

He further says, “ That to one *Sperma Ceti* Whale
 “ that has any of these Balls, there are two, that have
 “ nothing but the deep Orange-colour'd Liquor afore-
 “ said in their Bags.” This Remark confirms what a-
 nother Whale-man told me, “ that the Ambergris was
 “ found only in such *Sperma Ceti* Whales as are old and
 “ well grown.” It is the general Opinion of the Whale-
 men, that the Ambergris is produced only by the Male
 or the Bull *Sperma Ceti* Whale. As to this Particular,
 Mr. *Atkins* says, “ He never saw, nor certainly heard
 “ of a *Sperma Ceti* Female taken in his Life, the Cows
 “ of that Species of Whales being much more timorous
 “ than the Males, and almost impossible to be come at,
 “ unless when haply found asleep on the Water, or de-
 “ tained by their Calves.” This is certain, the Boats
 can never come near them, when they are awake, they
 are so very shy and fearful.

Mr. *Atkins's* Method of getting the Ambergris out of
 the Whale was thus ; after the Fish is killed, he turns
 the Belly upwards, and fixes a Tackle to the *Penis*,
 then cuts a Hole round the Root of the *Penis*, through
 the Rim of the Belly, till he comes to the Entrails, and
 then searching for the Duct or Canal at the further End
 of

of the Bag, he ties it pretty near to the Bag, and cuts the Duct off beyond it, upon which he draws forth the *Penis* by the Tail, and the Ambergris Bag, entirely follows it, and comes clean and whole out of the Belly.

* A very worthy Divine, and one of my intimate Acquaintance, in a neighbouring Town, who took the preceding Relation from Mr. *Atkins*, apprehends the Bag aforesaid to be the urinary Bladder, and the Ambergris Ball to be a certain Concretion, formed out of the greasy odoriferous Substance of the Liquor aforesaid contained within it. As for my own Part, I dare not pretend to give any Opinion upon the Point, but content myself with relating Matter of Fact.

I doubt not but that, in Process of Time, some farther Particulars may be procured with respect to Ambergris, and I shall be proud to transmit them; in the mean Time I hope the Society will accept of this first Essay, and allow my poor Country the Honour of discovering, or at least ascertaining the Origin, and Nature of Ambergris.

I cannot conclude this History of Whales, without acknowledging that I have been much assisted herein by the Reverend Mr. *Greenleaf* of *Yarmouth*, near *Cape Cod*, and Mr. *J. Coffin*, sometime of the Island of *Nantucket*, both of them Places famous for the Whale-Fishery.

* The Reverend Mr. Prince of Boston.
